they were divided into two groups, i.e. *Group A*: 68 knees, Kellgren-Lawrence grade 0, I, II, *Group B*: 37 knees, Kellgren- Lawrence grade III, IV. The twist angle was measured by each method. Associations between two measurements were evaluated using Spearman's correlation coefficient.
Results: The mean twist angle measured on axial radiography was7.18±1.57°, and 7.15±1.54°on CT images (Figure.1 r= 0.737, p< 0.01, discrepancies between axial radiography and CT images: 0.03±1.11°) in Group A. As to Group B, it was 6.79±1.88°on radiography, and 7.14±1.83°on CT images (Figure.2 r= 0.498, p< 0.01, discrepancies between the two methods: 0.27±1.82°). The number of the discrepancy over 2 degrees between two methods were 2 cases (2.9%) in Group A, and 9 cases (24.3%) in Group B.
Conclusions: As reported previously, we observed a correlation between axial radiography and CT images in both groups. The difficulty to identify the medial or lateral epicondylar prominences in some cases might cause discrepancies in two methods. Compared with Group A, Group B showed greater discordance between two methods. In general, as the grade of osteoarthritis is severe, radiographic severity such as large osteophytes and bone defects develop in medial, lateral, or posterior condyle. These changes of radiographic features may have stronger influence on discordance between two methods in Group B. Further study would be necessary to discuss results of measurements among inter- and/ or intra- observers.

Figure.1

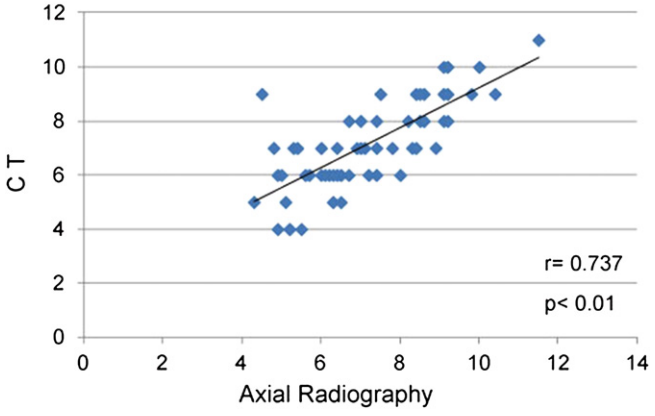
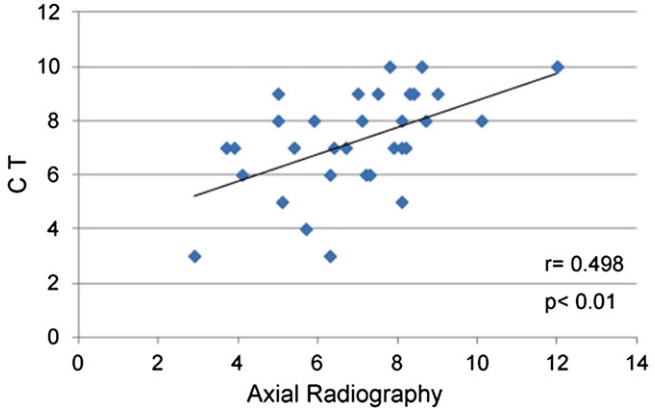


Figure.2



452
EFFECTS OF TRAINING INTERVENTION ON QUADRICEPS HEADS IN UNTRAINED MIDDLE-AGED WOMEN

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Purpose: Patients with knee OA display reduced quadriceps strength, and quadriceps weakness was observed to be a stronger determinant of functional disability and knee pain than the radiographic disease stage. Further, quadriceps strength was found to protect against the onset of symptomatic knee osteoarthritis, and the vastus medialis (VM) muscle has been proposed to be of particular importance in biomechanically stabilizing the knee. We have shown previously that 3-month strength and endurance exercise intervention in untrained middle-aged women led to a significant increase in the anatomical muscle cross sectional areas (ACSAs) of the thigh. The purpose of the current study was to explore whether training effects differ between the four heads of the quadriceps, and whether training reduces the intramuscular fat content, as estimated by muscular signal intensity in T1-weighted MR images in this population.
Methods: 35 untrained peri-menopausal women (age 45-55 y) were randomly assigned to endurance training (n=19) and strength training of the leg (n=16). Supervised training was performed 3 times per week for 60 min. over 12 weeks. Transverse, 10 mm MR images (1.5T) of the thigh were acquired before and after training intervention, using a T1-weighted turbo spin echo (TSE) sequence. The 33% distal MR slices between the transition of the quadriceps tendon and muscle distally and the start of the femoral neck proximally were segmented; volumes, ACSAs and muscle signal intensities (mean, standard deviation) were determined for the VM, vastus inter-medius (VIM), vastus lateralis (VL), and rectus femoris (RF).
Results: Across all 35 study participants, the increase in ACSAs by training intervention was +3.8% in the VM, 0.9% in the VL, 1.7% in the VIM, and 1.2% in the RF, with the VM and VIM showing a statistically significant increase ($p<0.05$). The differences in response (% increase by exercise intervention) between the quadriceps heads did not reach statistical significance ($p=0.27$; ANOVA repeated measures). Training effects on quadriceps heads for strength versus endurance training are shown in Table 1. There was no significant change in the signal intensity or in the heterogeneity (standard deviation, SD) of the signal intensity in any of the quadriceps heads within and between exercise training groups.
Conclusion: To our knowledge, this is the first study to explore differential training effects on the four quadriceps heads, including ACSAs and signal, as an estimate of intramuscular fat content. The data indicate that the exercise-induced increase in ACSAs in untrained middle-aged women may be somewhat stronger on the medial side (VM) than laterally (VL), but no significant alterations in MRI muscle signal were noted during the exercise intervention.

Mean+-Standard deviation (%) of the change in ACSAs and muscle signal over a 3 month training period

	Vast. Med.	Vast. Lat.	Vast.Int.med.	Rec. Fem.
Strength Exercise				
ACSA	+2.5±2.7	-0.2±7.6	+1.6±4.2	+1.7±11
Mean signal intensity	+1.4±7.7	+0.8±7.5	+2.3±9.4	+2.4±8.1
SD signal intensity	+3.5±11	+0.1±5.2	+0.4±10	+1.8±11
Endurance Exercise				
ACSA	+4.9±4.6	+1.9±9.8	+1.8±3.6	+0.9±12
Mean signal intensity	-3.0±7.4	-3.9±8.2	-4.6±9.6	-0.8±7.8
SD signal intensity	-5.1±17	-5.1±17	-4.6±20	-2.1±2.8

453
REPRODUCIBILITY OF 3D DELAYED GADOLINIUM ENHANCED MRI OF CARTILAGE (DGEMRIC) OF THE KNEE AT 3.0 TESLA IN PATIENTS WITH EARLY-STAGE OSTEOARTHRITIS

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Purpose: Delayed Gadolinium Enhanced MRI of Cartilage (dGEMRIC) is a validated and frequently used technique to non-invasively measure cartilage quality in the human knee. In previous research, it has been shown that 2D and 3D dGEMRIC are highly reproducible in healthy volunteers at 1.5 Tesla (T). Therefore, dGEMRIC could potentially be used as